

This seminar is intended especially for those professionals involved in evaluation, selection and application of computer languages. It provides a review of the salient factors of three major programming languages and their comparative advantages and disadvantages. With funds being spent on software now approximating those allocated to hardware, designation of the most efficient language for specific applications has become a critical matter of hard dollars-and-cents. Though all three languages are to be made available on IBM's System 360, special emphasis will be placed upon the PL/I role in future software developments. Tuition including luncheons and all course materials is \$220 for one student, and \$195 for each added student from the same organization.

I. FORTRAN PROGRAMMING

- A. Introduction
 - 1. The Character Set
 - 2. Constants and Variables
 - 3. Arithmetic Expressions
 - 4. Standard Functions
- B. The FORTRAN Program
 - 1. Declarations (Optional)
 - 2. Assignment Statements
 - 3. GO TO Statements
 - 4. PAUSE, STOP, and END Statements
- C. IF Statements, DO Statements, DIMENSION Statements
 - 1. Logical expressions
 - 2. IF Statements
 - 3. DO Statements
 - 4. DIMENSION Statements
 - 5. Use of Arrays
- D. I/O Statements
 - 1. Formats
 - 2. I/O Statements
- E. Subroutines, Functions, and Storage
 - 1. Subroutines
 - 2. Function Statements and Subprograms
 - 3. Equivalence Statements
 - 4. Common Statements

II. ALGOL PROGRAMMING

- A. Introduction
 - 1. The Syntax
 - 2. The Character Set

MARJORIE LINDSAY KIMBROUGH is a C-E-I-R consultant with seven years' experience in mathematical analysis and computer programming. Her background includes work with Lockheed-California and Burroughs Corporation. As a mathematical engineer with Lockheed-California she developed and programmed numerical methods for solution on the IBM 7090 of technical engineering problems, operations, and research and development. With Burroughs she was responsible for all systems support at the Georgia Institute of Technology B5500 installation and, among her other assignments, was responsible for developing and teaching staff courses in ALGOL, FORTRAN, and COBOL.

SEMINAR OUTLINE

- 3. Arithmetic Expressions
- 4. Standard Functions
- B. The ALGOL Program
 - 1. Statements and Declarations (Essential)
 - 2. Blocks and Compound Statements
 - 3. Assignment Statements
 - 4. GO TO Statements
- C. Conditional Statements, FOR Statements, Subscripted Variables
 - 1. Boolean Expressions
 - 2. The more powerful IF Statements
 - 3. The More flexible FOR Statements
 - 4. The more extensive Arrays
- D. I/O Statements and Diagnostic Statements
 - 1. File, Format, and List Declarations
 - 2. I/O Statements
 - 3. Monitor Statements
 - 4. Dump Statements
- E. Procedures
 - 1. Subprogram concepts
 - 2. Parameters

III. PL/I PROGRAMMING

- A. Introduction
 - 1. The Character Set
 - 2. Identifiers, Data, Constants
 - 3. Arithmetic Expressions
 - 4. Functions
- B. The PL/I Program
 - 1. Declare Statements

She is a graduate of the University of California at Berkeley, where she majored in mathematics and was a member of Phi Beta Kappa.

DR. WALTER E. SIMONSON is Director of Management Sciences at C-E-I-R, INC. and corporate representative on the SHARE PL/I Committee. His background includes work in computer design, information retrieval, and network scheduling. Before joining C-E-I-R, Dr. Simonson had software support responsibilities for a major computer maker, served as vice president of a research firm in Canada, and was associate professor of communication at the University of Southern Mississippi.

- 2. Assignment Statements
- 3. Simple and Compound GO TO Statements and Blocks
- C. IF Statements, DO Statements, The New Arrays
 - 1. Logical expressions
 - 2. IF Statements
 - 3. DO Statements
 - 4. Subscript Declarations
- D. I/O Statements, Diagnostic and Machine Control Statements
 - 1. Four kinds of I/O's
 - 2. The ON Statement
 - 3. The PAUSE and STOP Statements
- E. The New Subprograms
 - 1. Procedure Declarations
 - 2. Parameters
- F. New PL/I Concepts
 - 1. Structures
 - 2. Storage Allocation
 - 3. Asynchronous Procedures
 - 4. Extended I/O Facilities

IV. THE THREE LANGUAGES

- A. The Advantages of Each
- B. The Disadvantages of Each
- C. The Best Language for a Particular Job

V. FUTURE DEVELOPMENTS

VI. LANGUAGE STANDARDIZATION

C-E-I-R is an international applied research and data processing corporation that offers analytical, scientific and computer services to business, science and government. Founded in 1954, it is today the world's largest, most experienced and best equipped independent organization in its field. The C-E-I-R professional staff includes several hundred mathematicians, statisticians, economists, operations researchers, management scientists and others from a variety of disciplines. In addition, many of the finest scientific and professional men in America are retained on a consultant basis. Augmenting this professional capability are modern electronic computing equipment, and skilled computer programmers and operations personnel at computing centers in five major U.S. cities, The Hague, Mexico City, and San Juan.



Institute for Advanced Technology is the latest expression of C-E-I-R's long-standing involvement in management education. The revolutionary nature of computer-based methods made education an integral part of C-E-I-R operations from the beginning. This relationship is formalized through the Institute for Advanced Technology. IAT faculty members are drawn primarily from the ranks of C-E-I-R's professional and computer operations staffs. Its curriculum is drawn from subjects in which C-E-I-R staff members are expert—recognized for excellence in day-to-day application of the art and science of computer usage to the real problems of C-E-I-R customers in business and industry. Sharing these new skills through seminars in major cities, management clinics, and special, inplant training programs is the major goal of the Institute for Advanced Technology.

REGISTRATION: Tuition, including noon meals and all course materials is \$220 for the first student and \$195 for each additional student from the same organization. Classes begin each day at 9 a.m. and continue through 5 p.m.

HOTEL ACCOMMODATIONS: The Seminar is at the Georgetown Inn, 1310 Wisconsin Avenue, Washington, D. C. 20007. The Inn is holding a block of rooms for seminar participants at \$16 (single rate) until two weeks before the seminar. Hotel rooms are not included in the tuition, but reservation cards are furnished by IAT upon registration.

OTHER COURSES: The Institute for Advanced Technology program covers many subjects in the field of data processing and the management sciences. Among the seminars currently scheduled are:

- Production Planning & Scheduling
- Inventory Control & Management

For an outline of these or other courses in the IAT program, write:

REGISTRAR

Institute for Advanced Technology

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Dear PL Seminar Prospect:

Probably no segment of computer technology is undergoing so much ferment as are programming languages. Two distinct schools of thought are at work in the field -- those who would arrive at industry-wide standards in programming languages through a consensus of all major manufacturers and users, and those who would prefer to follow the lead of the dominant manufacturer, IBM, in defining languages specifications.


The outcome of this debate will be an important one for all computer professionals. A most pressing need right now for many people in the field is the acquisition of an "in-depth" background on this subject so they can determine how the best interests of the organization they work for can be served, as regards a choice of programming languages. To help in this quest, C-E-I-R, through its Institute for Advanced Technology (IAT) division, is once again scheduling the Programming Languages seminar which was so well received by the computing community upon its first presentation in 1964, and thereafter in 1965.

Basically, this advanced IAT Seminar attempts to give an objective evaluation of the advantages and disadvantages of three major programming languages -- PL/1, FORTRAN and ALGOL. Because PL/1 is the IBM sponsored language for its 360 system, special attention will be accorded it by course instructors with an eye towards helping each attendee understand what its total significance is. (System 360 will also include FORTRAN and ALGOL capabilities, rendering language selection decisions for this new equipment even more pertinent.)

The instructors for this IAT Seminar are two of the most thoroughly qualified individuals anywhere in the country on programming languages. Mrs. Majorie Kimbrough, a C-E-I-R consultant, has had seven year's experience in mathematical analysis and computer programming. She has worked with these languages literally from the ground floor up and is well qualified to speak authoritatively on their substance. Dr. Walter Simonson is Director of Management Sciences at C-E-I-R and also has an extensive background in software development.

Make no mistake -- software is fast becoming the most critical concern of data processing management. The funds expended on program development now approximate those spent on hardware. The IAT programming languages seminar is designed to give you a solid factual basis for making the many decisions on language which will enable these funds to be spent most wisely and efficiently. May I suggest that you make use of the enclosed reply card to make your reservation now and be sure of your spot, as attendance at the seminar will be limited.

Sincerely,


Robert D. Nixon
Director of Curriculum

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